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EXAMINER

MAHMOUDI, HASSAN

ART UNIT	PAPER NUMBER
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2175

DATE MAILED: 11/06/2003

10

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/747,054

Applicant(s)

BULKA ET AL.

Examiner

Tony Mahmoudi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121. DOV POPOVICI

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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DETAILED ACTION

Remarks

1. In response to communications filed on 02-September-2003, claims 1-5, 10, and 14-15 are amended per applicant's request. Claims 1-15 are presently pending in the application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-2, 4-6, 10 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al (U.S. patent No. 5,151,989) in view of Saks et al (U.S. Patent No. 5,666,532.)

As to claim 1, Johnson et al teaches a method of searching a file access system (see Abstract) for a requested file (see column 8, lines 9-22), comprising:

establishing a field in a directory i-node memory structure for files (see column 13, lines 52-59, and see column 17, line 64 through column 18, line 8) corresponding to a directory cache hash table (see column 20, line 63 through column 21, line 11), the field containing a

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pointer to the directory cache hash table (see column 18, lines 17-22, and see column 22, lines 35-48);

allocating memory for a directory cache (see column 5, lines 61-68, where “allocating memory” is read on “formerly stored directory cache”), cache hash table having an array of hash buckets (see figures 19-20, and see column 17, lines 61-63) which point to a list of files which may correspond to a specific i-node (see figure 20, and see column 18, lines 9-22, also see column 22, lines 2-28), the directory cache hash table storing directory layouts (see column 25, line 30 through column 26, line 9, where “storing directory layouts” is read on “storing units of directory information”);

searching the directory cache hash table for a requested file by hashing the file i-node to a specific bucket which contains a list of files that may correspond to the requested file i-node (see column 20, line 63 through column 21, line 11); and

if the bucket contains a matching file name, pointing to where the name of the requested file is stored (see column 20, lines 8-34, and see column 22, lines 2-60.)

Johnson et al does not teach: allocating memory for buffer cache (although Johnson et al teaches “local caching” in the BACKGROUND ART section of his invention (see column 2, lines 33-55.)

Saks et al teaches a computer method for ordered operations (see Abstract), in which he teaches allocating memory for buffer cache (see column 6, lines 23-32.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Johnson et al to include allocating memory for buffer cache.

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It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Johnson et al by the teaching of Saks et al, because allocating memory for buffer cache would enable the system to store data locally and at a faster rate, in which case, “pages that contain file data are used directly as the I/O buffers, while file system structural data are held in the buffer cache”, as taught by Saks et al (see column 6, lines 32-35.)

As to claim 2, Johnson et al as modified teaches the method further comprising conventionally searching file structures when the file name in the directory cache hash table is not found (see Johnson et al, figure 22, and see column 20, lines 8-34, where “conventionally searching” is read on “perform remote lookup”).

As to claim 4, Johnson et al teaches a method of accessing files in a file access system (see Abstract), comprising:

establishing a field in a directory i-node memory structure for files (see column 13, lines 52-59, and see column 17, line 64 through column 18, line 8) corresponding to a directory cache hash table (see column 20, line 63 through column 21, line 11), the field containing a pointer to the directory cache hash table (see column 18, lines 17-22, and see column 22, lines 35-48);

reading a directory into cache (see column 8, lines 14-15), the directory having a storage device representation (see column 9, lines 58-61, where “storage device representation” is read on “the disk”);

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converting the directory from the storage device representation to a faster representation (see column 17, lines 46-63, where “faster representation” is read on “caching” in order to “speed up searching”), the faster representation representing a layout of the directory (see column 25, line 30 through column 26, line 9, where “representing a layout of the directory” is read on “storing units of directory information”) with an array of hash buckets (see figures 19-20, and see column 17, lines 61-63) which point to a list of files which may correspond to a specific i-node; and

searching the faster representation for a requested file (see column 8, lines 20-23) by hashing the file i-node to a specific bucket which contains a list of files that may correspond to the requested file i-node (see figure 20, and see column 18, lines 9-22, also see column 22, lines 2-28);

wherein the storage device representation is maintained for backwards compatibility with pre-existing and older file access systems (it is inherent that files kept on disks, CDs, or other type of storage device representation are kept for the purpose of maintaining compatibility with pre-existing and older file access systems.)

For the teaching of buffer cache, the applicant is kindly directed to the remarks and discussions made in claim 1 above.

As to claim 5, Johnson et al teaches a method of accessing files in a file access system (see Abstract), comprising:

establishing a field in a directory i-node memory structure for files (see column 13, lines 52-59, and see column 17, line 64 through column 18, line 8) corresponding to a directory

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cache hash table (see column 20, line 63 through column 21, line 11), the field containing a pointer to the directory cache hash table (see column 18, lines 17-22, and see column 22, lines 35-48);

reading a directory into cache (see column 8, lines 14-15), the directory having a storage device representation (see column 9, lines 58-61, where “storage device representation” is read on “the disk”);

For the remaining steps of this claim, the applicant is kindly directed to the remarks and discussions made in claims 1 and 4 above.

As to claim 6, Johnson et al as modified teaches the method further comprising hashing selected directories into a hash table format (see Johnson et al, column 18, lines 17-22.)

As to claim 10, the applicant is kindly directed to the remarks and discussions made in claims 1, 4, 5, 6, 14 and 15.

As to claim 13, Johnson et al as modified teaches the method further comprising linking hash buckets to offsets where a name of the requested file is stored (see Johnson et al, figure 20.)

As to claim 14, Johnson et al teaches a computer server system (see Abstract, and see column 5, lines 52-68, where “server system” is taught), comprising:

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an outer cabinet housing memory, an array of storage devices, at least one power supply providing electrical power to the computer server system (it is inherent that a “server system” has “an outer cabinet housing memory, an array of storage devices, at least one power supply providing electrical power to the computer server system”), and

at least one processor (see column 1, lines 41-50) allocating memory for directory cache (see Abstract, and see column 5, lines 61-68, where “allocating memory” is read on “formerly stored directory cache”), the processor converting directories from a storage device layout to a faster representation which includes an array of hash buckets which point to a list of files which may correspond to a specific i-node, the faster representation including a pointer from a directory i-node memory structure to an associated hash table (the applicant is kindly directed to the remarks and discussions made in claim 4 above.)

For the teaching of buffer cache, the applicant is kindly directed to the remarks and discussions made in claim 1 above.

As to claim 15, Saks et al teaches a network (see Abstract) storage system (see column 14, lines 1-9, where “storage system” is read on “disk.)

For the remaining steps of this claim, the applicant is kindly directed to the remarks and discussions made in claims 1 and 14 above.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3 and 7-9, and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al (U.S. patent No. 5,151,989) in view of Saks et al (U.S. Patent No. 5,666,532), as applied to claims 1-2, 4-6, 10, and 13-15 above, and further in view of Ish et al (U.S. patent No. 5,778,430.)

As to claim 3, Johnson et al as modified teaches wherein the step of allocating memory for the directory cache hash table (see Johnson et al, column 5, lines 61-68, where “allocating memory” is read on “formerly stored directory cache”) includes selecting directories to cache using at least one of the number of files in a directory (see Johnson et al, column 9, line 55 through column 10, line 3, also see column 20, lines 47-55; and see column 22, lines 35-48.)

Johnson et al as modified still does not teach frequency of use.

Ish et al teaches a method and apparatus for computer disk cache management (see Abstract), in which he teaches hashing selected directories into a hash table format (see column 5, lines 41-44) according to frequency of use (see column 6, lines 7-13.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Johnson et al as modified, to include hashing selected directories into a hash table format according to frequency of use.

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It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Johnson et al as modified, by the teaching of Ish et al, because hashing selected directories into a hash table format according to frequency of use, would tailor the management of hashed data blocks to accommodate directories based on how frequently they are accessed.

As to claims 7 and 11, Johnson et al as modified teaches the method further comprising hashing selected directories into a hash table format (see Johnson et al, column 18, lines 17-22.)

Johnson et al as modified still does not teach hashing directories according to a size of the directory.

Ish et al teaches a method and apparatus for computer disk cache management (see Abstract), in which he teaches hashing directories according to a size of the directory (see column 5, lines 61-65.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Johnson et al as modified, to include hashing directories according to a size of the directory.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Johnson et al as modified, by the teaching of Ish et al, because hashing directories according to a size of the directory, would tailor the management of hashed data blocks to accommodate directories with different sized of data.

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As to claims 8 and 12, Johnson et al as modified teaches the method further comprising hashing selected directories into a hash table format (see Johnson et al, column 18, lines 17-22.)

Johnson et al as modified still does not teach hashing directories according to a frequency of access.

Ish et al teaches a method and apparatus for computer disk cache management (see Abstract), in which he teaches hashing directories according to frequency of access (see column 6, lines 7-13.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Johnson et al as modified, to include hashing directories according to frequency of access.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Johnson et al as modified, by the teaching of Ish et al, because hashing directories according to frequency of access, would tailor the management of hashed data blocks to accommodate directories based on how frequently they are accessed.

As to claim 9, Johnson et al as modified teaches the method further comprising hashing selected directories into a hash table format (see Johnson et al, column 18, lines 17-22.)

Johnson et al as modified still does not teach hashing directories according to a user selected criteria.

Ish et al teaches a method and apparatus for computer disk cache management (see Abstract), in which he teaches hashing directories according to a user selected criteria (see column 5, lines 37-40, and see column 8, lines 28-37.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Johnson et al as modified, to include hashing directories according to a user selected criteria.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Johnson et al as modified, by the teaching of Ish et al, because hashing directories according to a user selected criteria, would tailor the management of hashed data blocks to accommodate directories based on a pre-defined set of parameters submitted by the user.

Response to Arguments

6. Applicant's arguments filed on 02-September-2003 with respect to the rejected claims in view of the cited references have been fully considered but they are moot in view of the new grounds for rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiries concerning this communication or earlier communications from the examiner should be directed to Tony Mahmoudi whose telephone number is (703) 305-4887. The examiner can normally be reached on Mondays-Fridays from 08:00 am to 04:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dov Popovici, can be reached at (703) 305-3830.

tm

October 22, 2003


DOV POPOVICI
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